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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

October 9, 1937

"Surgery"

See Page 233

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SCIENCE NEWS LETTER

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The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

The history of London shows that up to 1800 any one walking in the city could reach green fields in ten minutes, in any direction.

It is claimed for conditioned air that it reduces the number of heat prostrations in summer and the number of colds in winter.

Rhodium, sister metal of platinum, is being used to plate highway signs, so that the letters will shine at night when headlights flash on them.

The "blasting and mildew" that attacked grains in Biblical days is now believed to be a description of what modern farmers call rust.

In an advertising experiment, it was found that black type on white background can be read 42 per cent. faster than white type on dark gray ground.

To replenish the sugar and salt lost by the body when a laborer works in hot surroundings, a pharmaceutical company is making tablets containing seven parts of salt to three parts of dextrose.

After seven years of experiments, the University of California has devised a way of making a crushed peach product of small clingstone peaches at reasonable cost, thereby putting these surplus peaches to new use.

Poison ivy is common to almost all regions of the United States.

China's population is estimated as low as 350,000,000 and as high as 500,000,000.

Falconers estimate the speed of a striking falcon at 150 to 175 miles an hour.

A farm in Lapland is said to be the only one in the world raising blue foxes in captivity.

In its winter sleep the lump-nosed bat curls its ears in spiral coils like a ram's horns.

Germany has a reserve of lignite in the lower Rhine region estimated at fifteen billion tons.

Workers in a famous glass factory in Germany have an orchestra, and play instruments made of glass.

Giants die young, judging by records on a number of men over seven feet tall who attained an average age of only 34 years.

Hawaii, with no less than 16 racial stocks in its population, has handled its racial problem with sanity and almost ideal results, says Lewis Browne, recent lecturer at the University of Hawaii.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

ARCHAEOLOGY

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DOCUMENTATION

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What type of building support is named for a flower? p. 227.

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PUBLIC HEALTH

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VOLCANOLOGY

When is Mauna Loa due to erupt next? p. 232.

PUBLIC HEALTH

Five Diseases Are Targets In Fight for Nation's Health

Cancer, Syphilis, Infantile Paralysis, Malaria and Yellow Fever Retreating Before Organized Attacks

FIVE major campaigns against disease are engaging the nation's disease fighters with renewed vigor, following the annual American Public Health Association meeting in New York.

With new financial support from the federal government and from private sources, and with fresh impetus, these men and women who protect our health are fighting as never before against such major foes as syphilis, malaria, cancer and infantile paralysis. At the same time, the lines have been strengthened against yellow fever and other diseases that may be imported from abroad.

Under the leadership of Surgeon General Thomas Parran, of the U. S. Public Health Service, also president of the American Health Association, the entire nation has taken up arms in the fight against syphilis. As a result, physicians and health officers are able to apply their knowledge of how to treat this disease and to stop its spread. In Chicago, where a poll was taken, an overwhelming number of citizens expressed their willingness to take the test which shows whether or not a person has the disease. In many communities, as soon as the health authorities started the anti-syphilis campaign, patients began coming to physicians for treatment, instead of hiding their illness and trying to cure it in secret with inefficient remedies. Health authorities apparently are well on the way to the conquest of this disease.

National Cancer Institute

Cancer, most dreaded of all diseases, can now be fought more relentlessly and on a larger scale than ever before. A National Cancer Institute to fight the disease was founded by an act of Congress and over $1,000,000 was provided to build and equip the Institute and provide for its first-year expenses, with more funds to be provided annually. Gathering and disseminating of present knowledge about the disease, purchase of radium to be loaned to institutions for cancer treatment and research into causes and methods of fighting this dread killer are the functions planned for the institute. Money alone will not conquer cancer, but it can help cut down cancer deaths by making treatment more widely available, by giving scientists a chance to discover better methods of treating and controlling it, and by teaching laymen and physicians all over the country how to do their share in fighting the disease.

Protective Spray

A better spray for protection against infantile paralysis got its first trials during the past summer. While it is too soon to know how much help this may give in controlling the disease, much hope is held for it. Even if this does not prove to be a sure means of preventing infantile paralysis, other methods of protecting children from the crippling ailment may be developed in the course of the research under the new National Foundation for Infantile Paralysis. (See page 234)

Malaria reached a peak of 4,000,000 cases during the past summer, one national health authority estimated. It is probable that this old disease foe will never again reach such a high point because during this same summer a unified malaria control program for all the southern states in the malaria area has been started. Grammar school children of the South will be the intelligence branch of the army in the renewed fight against this disease. A drop of blood from each of these children will lead health authorities to the strongholds of the malaria-carrying mosquitoes, wherever they may be hiding. Once their breeding places are located exactly, effective steps can be taken to route them and thus to free the entire South of the disease.

Side by side with these campaigns against disease within our borders have been instituted two new measures to keep foreign diseases out of the country. One of these is the new radio pratique by which incoming vessels are allowed to proceed to port if they have notified U. S. Quarantine authorities by wireless that no cases of disease are aboard ship. The other is the agreement entered into by the Pan American Sanitary Bureau and the Pan American Airways System for keeping yellow fever out of this country. The discovery of new yellow fever centers in South America at almost the same time that air travel brought that continent so much closer than ever before to the United States brought the menace of yellow fever uncomfortably and even dangerously close. The new measures include fumigation and vaccination.

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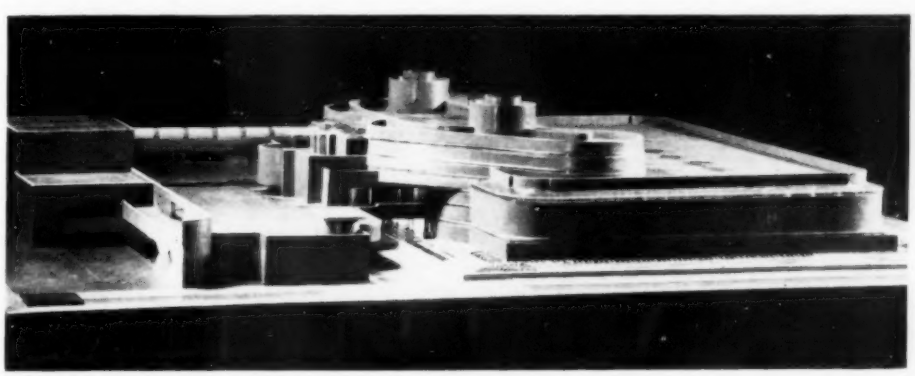
ENGINEERING

Windowless Building Built By "Organic" Architecture

SCIENCE, beauty, and maximum efficiency combine to make the long talked of futuristic industrial architecture a reality in the internationally famous architect Frank Lloyd Wright's latest creation.

In a new building (*Turn to Page 239*)



SCIENCE AND BEAUTY

Glass predominates in this latest Frank Lloyd Wright creation, a wax factory at Racine, Wis. Full daylight and air-conditioning feature the building, which is without windows. Novel "upside-down" columns effect important savings in floor space.

DOCUMENTATION

Documentation Congress Step Toward Making "World Brain"

Paris World Meeting Sees Microfilm as Useful Tool In Libraries and For Publishing Unprinted Material

ENGAGED in beginning the creation of a "world brain," as H. G. Wells phrased it, representatives of 45 countries participated in the first World Congress of Universal Documentation in Paris, Aug. 16-21.

Librarians, scientists, editors and others who marshal and create the written record of civilization discussed in a medley of languages the methods and necessities of welding the intellectual resources of this planet into a unified system.

The nuclei of this world brain exist in the various great intellectual centers—the libraries, journals and indices of recorded knowledge—and the task considered is how to exchange and distribute more effectively the past, current and future accumulations in all fields of human endeavor.

Microfilming loomed large in the discussions as a new technique that will bring the libraries of the world to the desks of individuals or will allow many world locations to have and use the world's accumulations of records, literature and documents. This method consists of photographing manuscripts, illustrations, books and other documents upon motion picture film so that they occupy a mere hundredth or less of the area of the original. These miniature photographs or microfilms are magnified in order to read them.

World System

One of the resolutions of the Congress urged the establishment of microfilm copying services in the libraries of the world so that a scholar or scientist of any country may obtain a microfilm of any of the material on file in all these storehouses of knowledge. Such a network of microfilm copying services has had its beginnings in America where libraries of Washington cooperate with Bibliofilm Service operated by the American Documentation Institute. Another resolution specifically suggested that microfilm should be used for making available the enormous manuscript and graphic material gathered by weather services.

With a view to broadening the world organization of documentation, the Congress asked the International Institute of Documentation, now a union of documentation centers, to transform itself into the International Federation of Organizations of Documentation. A permanent international committee of the new federation would be charged with organizing future congresses, and the next World Documentation Congress is scheduled for Frankfurt, Germany, in 1940.

Resolutions Passed

Other resolutions of the Congress dealt with: The uniform preparation of articles for technical and scientific periodicals; the standardization of methods of classifying books and other documents; the preparation of union catalogs so that they may eventually be consolidated internationally; the indexing of daily newspapers; the building of bibliographies on cards; the gathering of literature upon documentation techniques; the development of cooperation between specialized organizations and libraries; extension of the work of the International Institute of Agriculture; the establishment of agencies in all countries for the distribution of their official documents; the printing and exchange of library cards.

Personalities, periodicals and libraries come together to build the network of documentation, the rudimentary "world brain," that promises to bridge between different geographical locations and between this generation and those succeeding.

First ideas or facts are recorded and published in some manner or other—in a newspaper, a scientific or scholarly journal, a letter or memorandum, a book or a microfilm.

Second, this growing mountain of the world's literature or documentation must be ordered, classified, indexed so that things can be found and used. This is the weakest link in the chain, despite the great catalogs, card files and many abstract journals.

Third, the world's documentation must be preserved and kept on file so that those who wish to use it can do so. This is the task of libraries and documentation centers.

Libraries Important

Libraries because of their size and physical presence are the most visible units in the documentary mechanism. They range from the great British Museum Library, the Bibliotheque Nationale, the Library of Congress, and the Berlin State Library down to the few shelves of books in a scholar's study.

Personalities create and operate the mechanisms that serve documentation. From its many phases came some 400 experts to attend the World Congress of Universal Documentation at Paris.

The president and organizer of the Congress was Dr. Jean Gerard, who presides over the Maison de la Chimie (House of Chemistry) which serves as a French and international center for chemical information.

In 1895 Paul Otlet began the world organization that is now the International Institute of Documentation. Today he is still youthful and enthusiastic though white-bearded, and he came from Brussels to be an honored and leading figure in the Congress.

The head of the German delegation, which numbered over 20, was Dr. H. Krüss, general director of the Preussischen Staatsbibliotek (Berlin State Library) whose fluency in idiomatic English and French aided international accord.

From England came H. G. Wells, the writer; Hilary Jenkinson, head of the British Foreign Office Archives; Dr. S. C. Bradford, director of the Science Museum Library, and other leaders.

Julien Cain, general administrator of France's National Library, was one of the leading hosts to the Congress, while Dr. Pierre Bourgeois, of the Maison de la Chimie, edited and translated the reports and discussions.

Dr. Alingh Prins, head of the Dutch Patent Office and president of the International Institute of Documentation, and Dr. Marcel Godet, director of the Swiss National Library and president of the International Committee of Libraries, represented important national and international affiliations.

American Delegation

Americans in attendance represented many phases of documentation in the United States. Official delegates included: Dr. Worthington C. Ford, honorary European representative of the Library of Congress; Herman H. Fussler, head of the University of Chicago's microphotographic laboratory; Miss M. Alice Mat-

thews, librarian of the Carnegie Endowment for International Peace; Miss Margery Quigley, librarian of the Montclair, N. J. Public Library; Miss Sabra M. Vought, librarian of the U. S. Office of Education; Prof. Douglas Waples, of the University of Chicago's Graduate Library School; Watson Davis, president of the American Documentation Institute and chairman of the delegation. Others attending the Congress included: Dr. R. H. Draeger, surgeon in the U. S. Navy; Dr. Atherton Seidell of the National Institute of Health; Dr. J. T. Vance of the Library of Congress; Prof. Carroll D. Champlin of Pennsylvania State College; and Miss Jose Meyer of the Library of Congress.

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DOCUMENTATION

Today's Distress and Horrors Basically Intellectual—Wells

"Race Brain" Can Now Be Duplicated and Preserved From Destruction; "Civilization is a Phoenix"

By H. G. WELLS

In an address before the World Congress of Universal Documentation, Paris

(Mr. Wells opened his address by explaining that he approached the work of the Congress from quite another angle than most of the other members. He acknowledged the admirable hospitality tendered the gathering and the energy and organizing power of Dr. Jean Gerard, president of the Congress, and his able associates. He said that he liked to think that he is a *precursor* of a growing appreciation of the necessity, importance and promise of the work of documentation by the outside world.)

I SAY I come in from quite another angle, whether I am an intruder or whether I am—as I like to think I am—a *precursor* of a growing appreciation of the necessity, importance and promise of your work by the outside world.

It is dawning upon us, we lay observers, that this growing work of documentation and bibliography, is in fact nothing less than the beginning of a world brain, a common world brain. What you are making, we realize, is a sort of cerebrum for humanity, a cerebral cortex, which, when it is completely developed, will constitute a memory and also a perception of current reality for the entire human race. This is exciting the imagination of some of us very greatly.

Plainly what is indicated is a unified and uniform organization.

Same In All Lands

Knowledge is the same in all lands and countries.

As Mr. Watson Davis is here to remind us, it need not now have any single local habitation. It need not have the vulnerability of physical material centralization because the continually increasing facilities of photography render reduplication of our indices and records continually easier and cheaper. In these days of destruction, violence and general insecurity, it is comforting to think that the brain of mankind, the race brain, can exist in numerous identical replicas throughout the world in Peru, Iceland, Wales, New Zealand, as well as here in Paris. Workers in any part of the world may contribute to the growth.

At first our activities are necessarily mainly receptive. We begin most easily with the documentation of concrete facts, but *ideas are also facts* and I do not see how this new and great encyclopedia, this race brain whose foundations you are laying, can fail to develop into anything but a mighty structure for the comparison, reconciliation and synthesis of common guiding ideas for the whole world. What is gathered will be digested and the results returned through the channels of education, literature and the press to every individual in the planetary community.

Please do not imagine that I am indulging in any fantasy when I talk of your work and your accumulations as the rudimentary framework of a world brain. It is either that or nothing.

Mental Organization

I am speaking of a process of mental organization throughout the world which I believe to be as inevitable as anything can be in human affairs. All the distresses and horrors of the present time are fundamentally intellectual. The world has to pull its mind together, and this is the beginning of its efforts. Civilization is a Phoenix. It perishes in flames and even as it dies it is born again. This synthesis of knowledge upon which you are working is the necessary beginning of a new world.

It is good to be meeting here in Paris where the first encyclopedia of power was made. It would be impossible to overrate our debt to Diderot and his associates. It is good for the representatives from forty countries to be breathing the clear, comprehensive and systematic mental atmosphere of France, to be recreating themselves in the presence of its sympathetic constructive understanding.

Again I would thank our hosts for bringing this Congress together here and enabling a number of widely scattered workers to realize something of the true greatness of the task to which they have devoted themselves.

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DOCUMENTATION

How Documentation Promotes Intellectual World Progress

By WATSON DAVIS

(*The address of the head of the American Delegation to the World Congress of Universal Documentation, Paris.*)

THROUGH the daily, flowing, unending stream of the written and pictorial record of all phases of life, the peoples of the world have their best opportunity of knowing each other as intellectually motivated communities striving to progress and make the world a better place in which to live.

What a wide compass is included in this conception of "documentation." Letters, periodicals, pamphlets, newspapers, books, business and official records, manuscripts, notebooks, motion pictures, radio transcriptions, phonograph records, photographs, drawings and paintings,

and even samples and specimens when words and pictures fail to convey full understanding. Documentation permeates the post office, the telegraph and cable systems, offices, libraries, archives, radio, museums, laboratories, chanceries and cottages, from the smallest collection of books and letters to the great institutions of world capitals.

Obviously documentation is truly universal, even in the literally astronomical senses since photographs taken through great telescopes now record the great stellar galaxies that dwarf our own Milky Way! Obviously also with such a field it is necessary to confine our aspirations and attention to the more immediate and practical aspects wherein there is some chance of effective international cooperation.

Intellectual Exchange

Despite the seemingly chronic disturbed state of the world, it is a hopeful fact that exchanges of intellectual intelligence are almost uniformly continuous and effective. Scientists of one country conduct joint researches with fellow specialists of another nation, even though the political and military leaders of those two nations may be glaring at each other. Librarians work with foreign libraries almost as though they were under the same flag. Such exchanges in the intellectual world make for optimism for the world's future.

One of the newer and most promising tools of documentation is the microfilm. Compact, to an extraordinary degree, promising to outlast our omnipresent paper, and capable of reproducing anything that the eye can see, even in natural colors, microfilms promise to hurdle some of the present barriers to easy and effective interchange of intelligence in many fields.

New Freedom

In many aspects the expert today is besieged just as effectively as Paris was in 1870 when the French photographer, Dagron, made the first microfilm and saw it flown out by carrier pigeon. The expert is ringed by high printing costs, by the scarcity of many publications published in small editions and not widely distributed, by inability to locate what has been published. Microfilm may very well lift this siege. It promises to give the specialist or research worker in science, both in its physical and more human aspects, in economics, literature, history and all other intellectual fields a new freedom in both publishing his own accomplishments and knowing what others have done.

Most immediate and practical to put into operation is the microfilming of material in libraries upon demand. It will become fashionable and economical to send a potential book borrower a little strip of microfilm for his permanent possession instead of the book and then badgering him to return it before he has had a chance to use it effectively. I believe that reading machines for microfilm will become as common as typewriters in studies and laboratories. If the principal libraries and information centers of the world will cooperate in such "bibliofilm services," as they are called, if they exchange orders and have essentially uniform methods, forms for ordering, standard microfilm format and production methods and comparable if not uniform prices, the resources of any library will be placed at the disposal of any scholar or scientist anywhere in the world. All the libraries cooperating will merge into one world library without loss of identity or individuality. The world's documentation will become available to even the most isolated and individualistic scholar.

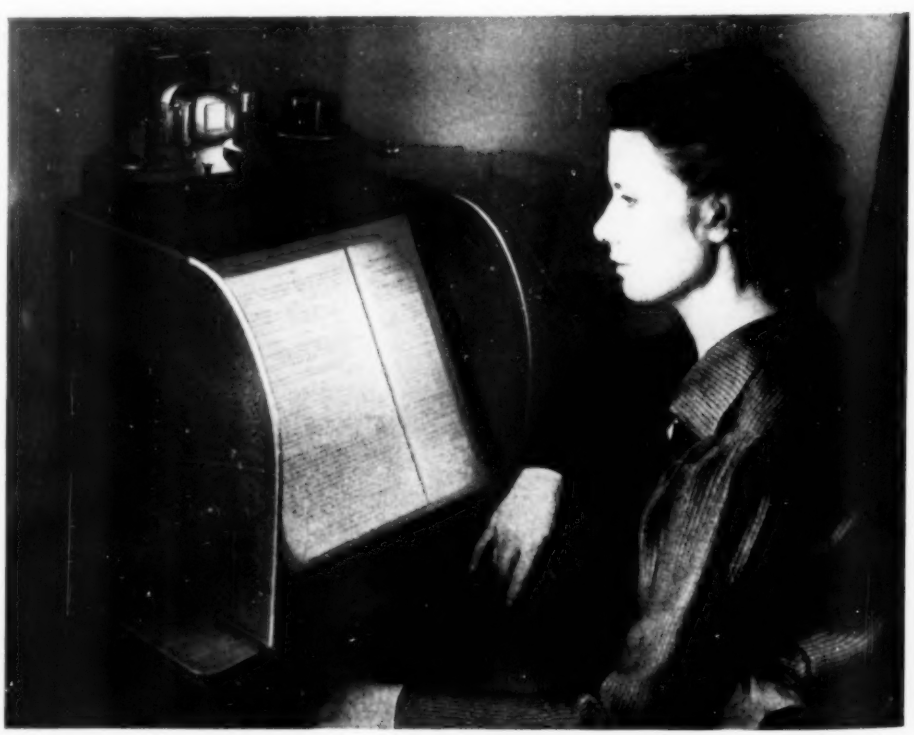
Successful Operation

The practical nature of this project is indicated by three years of successful operation of Bibliofilm Service in the Library of the U. S. Department of Agriculture. This fall this service will be extended to the Library of Congress, the national library of the United States, and the Army Medical Library, America's largest medical collection. America is ready to do its share in the establishment of a world net of bibliofilm services. Perhaps this can be best organized on a national basis, with one library or agency in each country undertaking to handle and route orders from other countries in the interest of expediting and making effective such interchanges.

Auxiliary Publication

Supplementary to the problem of making available existing literature is the securing of publication for all the material that should be recorded and made available to the intellectual workers of the world. In this microfilm can play an important role, giving publication with economy and effectiveness.

The microfilm can be used to secure what can be called "auxiliary publication." It will supplement other forms of publication and make accessible material of all sorts that can not now be printed because of economic factors. It will make available valuable research



NEW TOOL FOR READING

The reading machine for microfilm is expected to become as useful and prevalent in libraries, research laboratories and studies as the familiar writing machine or typewriter. The tiny images on microfilm are enlarged optically and projected on a translucent screen to more than original size.

data that now go unrecorded. It will make available out-of-print and rare books. It is adapted to the publication of photographs and other illustrations. Auxiliary publication service (which might be named Docufilm Service) should be auxiliary to established channels of scholarly publication and it should aid and not hinder journals. Editors of journals and institutions should act as intermediaries between the authors and the "Docufilm Service."

This idea has been given an experimental demonstration in America in connection principally with scientific papers. A journal editor publishes as much or as little of a technical paper as he wishes. In the case of a very specialized paper it may be only an abstract or summary. He appends to the notice or article a note saying that the full article with diagrams, pictures, etc., can be obtained by remitting a certain price and specifying the document number under which this full article has been deposited at the central agency operating the auxiliary publication service. Orders are sent by readers directly to this central agency, which is the American Documentation Institute at Washington, D. C. Microfilms of the document are made only if and when ordered. In this way the document is perpetually "in print" but no extensive, space-consuming stocks need be stored, only the document itself and the microfilm negative from which positives are made for distribution. The operation of the plan is simple and uncomplicated and editors may use it when, how and if they find it helpful. No financial participation or guarantees from the editor or author are required.

Docufilm Centers

It is believed that this or analogous techniques can be adopted in other countries, preferably with central agencies serving those countries. If this is done there can be effective exchange of negatives between "Docufilm centers."

While the plan of auxiliary publication suggested could be used with other methods of duplication, microfilm is the least expensive and most universal in that it will handle text and illustration.

Bibliofilm and Docufilm are capable of immediate utilization. They can begin small and be allowed to grow as needed.

Another documentation project of importance to the world is much more formidable and cannot be accomplished without much planning, development and international cooperation. This is the possibility of a world bibliography, beginning in the field of science but eventually extending to all fields.

The economy and compactness of microfilm gives new hope that a world science bibliography may be accomplished without ambitious hopes and promising plans being drowned in a sea of cards and smothered in a maze of details. It is possible to visualize the creation in some world center of a card file with a card for every article, paper, book or document published in science that is important to the written record.

When it is considered that most of the scientific literature of the world has been listed by title or abstract bibliography somewhere in abstract journals, in special bibliographies or such large card compilations as exist in the Science Museum Library at London, the task while gigantic does not seem impossible. The last and essential link in the possibility is the use of microfilm for multiplying the cards under various classifications and in copying for distribution. I repeat that this is a large project needing international thought and probably years of gestation. Classification, the technique of bibliography and a dozen other factors in documentation to which many have unselfishly given their lives will find fruition in such a project.

I hope that such mere samples of the great possibilities of documentation development will convince the world at large of the importance of work in this field. Those of you who have organized this congress, and those who have worked for years in the upbuilding of the International Institute of Documentation need no convincing of the importance of this work to intellectual progress. It is a matter of world concern and international effort.

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GENERAL SCIENCE

Science Needs Synthesis As Much as Discovery

THE METHODS of scientific advance into new frontiers of knowledge are the methods of all great conquerors of military history; divide and then conquer. This was the message offered by Dr. Nolan Don Carpentier Lewis, director of the New York Psychiatric Institute, at the opening exercises of the Columbia University School of Medicine.

But Dr. Lewis added a pertinent warning. Along with the splitting of difficult problems into their component parts and success in solving the parts there must also be present a clear realization of the significance of what has been learned, and a blending together of all the knowledge. He continued:

"Sometimes I think men are needed who can arrange in synthesis the facts already discovered more than we need new facts. The organized specialists tend to dictate the direction of scientific research toward analysis and mechanism. There seems to be some lack of interest in the art of synthesis."

Even faith enters into the successful pursuit of scientific knowledge, Dr. Lewis pointed out, saying, "Faith also plays a role; not that faith which in the words of Sir Thomas More 'once wedded fast to some dear falsehood hugs it to the last,' but the faith in ultimate success."

"In interpretation," he concluded, "it is necessary particularly to guard against a dangerous tendency of the human intellect—the tendency to accept as valid a plausible explanation and then look for the facts to support that explanation. No device however perfect yet discovered can wholly deprive the human intellect of its capacity to make mistakes, but many may be avoided by a cruel criticism to control thinking, and the development of a boundless caution in regard to all conclusions.

"Above all never refuse to see what you do not want to see or what might go against the views of authority. If one is naturally prone to form emotional prejudices and realizes it, he may by conscious effort succeed in becoming a shining example of fairmindedness. When a finding or idea is contrary to authority or even to common sense, it may be the clue to follow. Many discoveries are contrary to common sense.

"Uncommon sense is now needed in many situations. We should be stimulated by authority but not paralyzed—admire but not worship. Every advance in science has been at the expense of someone's reputation as an authority. The best plan is to keep the mind free—consciously keep it from crystallizing around formulas of any kind except as working hypotheses which it may be necessary to scrap tomorrow."

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VOLCANOLOGY

Mauna Loa Eruption Soon Is Dr. Jaggar's Prediction

MAUNA LOA, 13,675-foot volcano on the island of Hawaii, is due for eruption soon, predicts Dr. T. A. Jaggar, volcanologist of the U. S. National Park Service. He expects it to be a lava eruption, and does not look for destruction of property or loss of life.

Hualalai, another major volcano on the island, may also go into action, he thinks. Hualalai has been inactive since 1801, when it ended a prolonged eruptive spree—22 years.

Other Hawaiian scientists join with Dr. Jaggar in expecting volcanic outbreaks before very long.

Brother Othmar, astronomer at St. Louis College, likewise is of the opinion that Mauna Loa or Kilauea will burst into eruption shortly. E. K. Martin, U. S. Weather observer, adds statements by old natives of "volcanic weather" to his prediction of likely volcanic action.

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GEOPHYSICS

Plato First to Declare That Earth Is a Sphere

COLUMBUS did not prove that the earth is round, as we were painfully taught in school. He did not even try to; he just took it for granted, as did all educated men of his time. The sphericity of the earth had been an accepted thing in the minds of scholars for many centuries. Even in the so-called "Dark Ages" really well-informed persons were mostly "round-earthers."

The idea of a spherical earth was familiar to Greek philosophers from the fifth century B. C. onwards, declares Dr. William Arthur Heidel of Connecticut Wesleyan University, in his new book, "The Frame of the Ancient Greek Maps," published by the American Geographical Society. Even before that, some philosophers said things that have been interpreted as indicating belief in the rotundity of the earth, but Dr. Heidel is not able to find anything really unequivocal earlier than Plato.

In one of Plato's reports of a purported discussion by Socrates, the earlier philosopher (who had been Plato's teacher) is made to express the belief "that the earth is really round and at the center of the heavens." This statement is made after an inquiry about the writings of Anaxagoras, implying that the question whether the earth is round or flat was a subject of lively debate.

Two later Greeks, Philo and Pytheas, who wrote about 300 B. C., apparently made critical geographic and geodetic studies bearing on the sphericity of the earth. Philo was a Navy man who served in Egypt and on the Red Sea, and Pytheas made his studies in what was, for the Greeks, the Far North.

The theories formed in these early days, the evidence in their support, were never lost. They survived through the Middle Ages and were a part of the cultural equipment of the navigator from Genoa who was bold enough to treat them as dependable working facts.

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ARCHAEOLOGY

Ancient Indians May Reveal Poor Areas for Farming

INDIANS who lived in prehistoric America may reveal undependable areas for farming—regions that turned into dust bowls in the past and may be expected to do so again.

This is the hope of archaeologists who are beginning to explore the land in the Great Plains states, seeking Indian evidence buried beneath the white man's feet.

Just returned from Kansas, Dr. Waldo R. Wedel of the Smithsonian Insitution reported that he has unearthed village sites of varying ages. Accumulating evidence from such excavations, he said, shows that group after group of prehistoric Indians settled in sections of Kansas and Nebraska. Both hunters and farmers came. The farmers apparently would do very well while the weather was relatively wet, but after a few generations they would be driven out, perhaps by drought. The land would remain deserted for a long time. Then came a new group to repeat the process.

Discovery by Dr. Wedel of pottery like that made by the famous Hopewell Mound Builders is a new revelation that this kind of Indian culture spread west as far as Kansas City. These Mound Builders were concentrated in the Mississippi and Ohio River valleys. Now, it appears that they, or Indians influenced by their manner of living, were one group that tried to conquer an undependable area and were tricked by it.

That Indian excavations can aid in showing where undependable areas for farming lie is, Dr. Wedel emphasizes, no more than a theory at present. But archaeology does provide lessons from the past, and Plains prehistory may have this useful application.

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IN SCIEN

MILITARY SCIENCE

Not So Pretty or Pleasant Is One Exhibit at Paris

AMID the colorful lighting and the splendor of the Paris International Exhibition, strung along the two sides of the Seine in the heart of the great world city, one comes upon an unbeautiful, stark display labelled: "La Defense Passive."

Light hearted couples on holiday from the provinces stop and view this section with a sober fascination. Those who have seen the modernistic interior decoration displays with the French equivalent of "I wish we could have that!" here stand with unspoken hope that they may never have what they see before them.

For passive defense measures consist of preparedness against gas attack. There is a map with blood red dots upon it showing where great stations of Paris' subway, the Metro, have been enlarged to provide refuges for thousands who will crowd them when and if gas and bombs are rained from the air. There is a model of a great underground hospital with crowded wards, with gas casualties writhing in agony.

Strange creatures clad in gas proof costumes, masks, unwieldy gloves and boots—what the safely dressed man or woman will wear in the next war—stand around on display. And one wall is lined with examples of how a door can be constructed to keep gas out.

In miniature a gas clean-up squad, with the methodic matter-of-factness of firemen, are mopping up where bombs have splashed deadly stuff into a street such as the one that you might live in if you were French.

Any large city in Europe could and probably does have such a display. The contrast is greater in Paris of 1937 with its great exposition of art and technique, crowded with foreigners as well as French, all suppressing their fears of the possibility of an insane war that might cause other governments to send gas and bombs to Paris instead of fine buildings, exhibits, and art and scientific treasures.

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FIELDS

PHYSIOLOGY

Dyes Which Stained Brains Also Induced Anesthesia

DYES MAY help scientists find better anesthetics for surgical operations, it appears from studies by Drs. Axel M. Hjort, David W. Fassett and Edwin J. DeBeer of the Burroughs Wellcome and Company's Experimental Research Laboratories at Tuckahoe, N. Y.

In their report to the journal, *Science,* these investigators explain how they combined certain modern local anesthetics with dye-forming chemical groups and then tested them on white mice. The dye-anesthetics all stained brain as well as other body tissues when injected into the mice. The non-anesthetic dyes stained tissues generally but did not stain the brain tissues. (*Science,* Sept. 24.)

These results, the scientists explain, promise to provide material for further investigations which may "lead to a better understanding of the processes underlying the phenomenon of anesthesia."

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GEOGRAPHY

Claim Portuguese Found America Before Columbus

ARMED with new documents, new interpretations, a Portuguese historian hurls the challenge that Portugal's bold seafarers—not Columbus—discovered America.

Reopening an argument that seems never to stay quiet long, Dr. James Cortesao declares there is no want of documents to prove Portugal's part in the discovery. The main trouble, in his opinion, has been that documents were not understood.

Two errors have obscured this chapter of world exploration, the Portuguese historian explains in a painstaking report to the British Geographical Journal. These errors are: 1. Failure to realize that government policy might have led Portugal to keep the discovery secret. 2. Taking for granted that it was harder to cross the Atlantic than to sail on long coastal voyages.

On the first count, Dr. Cortesao argues that Portuguese monarchs in those days were merchant kings. And it was part of the game to keep other nations from knowing distant trade routes, lest they elbow into profitable monopolies in spices and gold.

Official chroniclers ignored discovery voyages when policy demanded; or chapters indiscreetly written might be suppressed.

As for hazards of crossing the Atlantic, the Portuguese historian rates this voyage, with its helpful trade winds and the equatorial stream, as far less daring than sailing from Europe to Africa's Cape of Good Hope.

Portugal's story, built from deductions and bits of evidence, shows Portuguese navigators reaching land northwest of the Azores—identified as the Newfoundland bank—in 1452, but they did not land. By 1486, it continues, Portuguese navigators knew of a continent to the west, and Brazil was known to them before Columbus' voyages. And in 1492, the Portuguese historian says, there is a map which places the land to the West in a fairly correct position.

Columbus will doubtless go on being "Columbus" to most of the world. But discovery of America by Portuguese is, so Dr. Cortesao tells us, "a historic fact for the majority of Portuguese historians."

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CHEMISTRY

Patent Granted on "Three In One" Hand Gas Grenade

THE U. S. Patent Office has granted a patent to a Pittsburgh inventor on a gas grenade that may be described as three grenades in one.

The grenade, to be thrown by hand, consists of three sections, each of which may explode separately and scatter gas at a point distant from the others, the patent papers reveal.

The patent, number 2,094,562, has been assigned by its inventor, Alexander Lowy, to the Federal Laboratories, also of Pittsburgh.

Three or more sections, each containing gas, can be built into the grenade. The ignition mixture which sets off a section is a sufficiently powerful explosive not only to scatter the gas in the section, but completely to separate the section from the remainder of the grenade. In effect, when used, first one section would go off, then a second a little further along the grenade's flight, with additional explosions until the grenade is exhausted.

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MEDICINE

National Advisory Cancer Council Appointments Made

NAMES of six men who will help the federal government in its new drive against cancer have just been announced by Surgeon General Thomas Parran, U. S. Public Health Service, with the approval of the Secretary of the Treasury.

These men who will form the National Advisory Cancer Council are: Dr. James Ewing of Cornell University Medical College and Memorial Hospital, New York; Dr. Francis Carter Wood, director of the Institute of Cancer Research at Columbia University; Dr. C. C. Little, director of the Roscoe B. Jackson Memorial Laboratory at Bar Harbor, Me.; Dr. Arthur H. Compton of the University of Chicago; Dr. James B. Conant, president of Harvard University; and Dr. Ludvig Hektoen, director of the McCormick Institute for Infectious Diseases, Chicago, and member of the Board of Trustees of Science Service. Surgeon General Parran is an ex officio chairman of the council.

The first meeting of the new council will be held as soon as possible, probably in October, to consider rules and regulations for grants-in-aid and fellowships in cancer research and minimum requirements for treatment centers to which radium will be loaned by the National Cancer Institute. These grants and loans will be the first guns fired in the war against cancer which was started on a nation-wide basis by the act of Congress providing for the National Cancer Institute.

The Cancer Institute will be erected at Bethesda, Md., part of the National Institute of Health of the U. S. Public Health Service. Congress provided $750,000 for the building and equipment and another $700,000 annually.

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ENGINEERING

Injured Ships Saved From Ship Graveyard by Welding

See Front Cover

THE modern ship's doctor heals the wounds in a worn hull by welding as shown on the front cover of this week's SCIENCE NEWS LETTER. The injured stern frame pictured there belongs to the cargo ship "Alabaman" receiving first aid at the Oakland, California, yard of the Moore Drydock Co. The "surgical" apparatus is made by the Lincoln Electric Co.

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MEDICINE—PUBLIC HEALTH

Battling a Plague

Scientists, Liberally Financed From President's Ball, Seek Protective Vaccines, Sprays, and Immunity Tests

By WATSON DAVIS

NEVER before did men fight a disease plague with such planned scientific determination.

Never have two score disease fighters, good, careful and unemotional scientists, all of them, banded together so closely and yet so independently to learn all they could about a human ill—and perhaps to conquer it.

Never has a birthday done so much to make safer the lives of the little children of years to come.

It is Jan. 30, 1935. Music, dancing, gay young couples and distinguished men and women—it is a ball, festival of rejoicing to honor the President of the United States on his birthday —but more important a rally to fight a plague. F. D. R. has known and overcome infantile paralysis. No better birthday present to him could be imagined than provision of support for the fight upon infantile paralysis.

So after the ball was over, there was a war chest—not just funds for the careful nursing and reconditioning of bent bodies back to health, not just support for the hospital at Warm Springs, Ga., and dozens of similar local human repair shops—but money for research.

Dollars where pennies were lacking before—thousands of dollars and each dollar perhaps to save a life of a child yet unborn. It was $241,000—thirty per cent. of the President's Birthday Ball proceeds. Dollars that meant crucial experiments could be made promptly and on a wide scale.

Militant Band

A militant band came into existence —a group of leading medical researchers marshalled by Dr. Paul de Kruif, bacteriologist-writer, he of "Microbe Hunters," and steered by an advisory medical committee consisting of Dr. George W. McCoy of the U. S. Public Health Service, chairman, Dr. Max B. Peet of University of Michigan, Dr. Donald B. Armstrong, of Metropolitan Life Insurance Company, and Dr. Thomas M. Rivers of Rockefeller Institute for Medical Research — disease fighters all. And Jeremiah Milbank, well-known philanthropist, is acting chairman of the Research Commission.

Back of "The President's Birthday Ball Commission for Infantile Paralysis Research" is the Georgia Warm Springs Foundation itself with President Franklin D. Roosevelt as president; Keith Morgan, Equitable insurance executive, as vice-president; and Basil O'Connor, formerly President Roosevelt's law partner, as treasurer.

Money, hard work, imagination and enthusiasm do not necessarily assure the conquest of a disease. Scientists may work for years and not produce the preventive and curative measures that are so earnestly needed and desired. So the renewed attack on infantile paralysis that began in 1935 was made hopefully but with no guarantee of success.

The scientists knew that it was an infectious disease, but exactly how and why were riddles. They knew that if experimental animals could be protected, then there was a chance that the method would be safe and simple enough to use in combatting the epidemics that every year threaten our children.

Vaccine?

In fact, distinguished investigators brought forth evidence that vaccines prepared from the virus would protect experimental animals. Should they be tested on little children? That was the first great decision of the anti-polio campaign.

Vaccination prevents smallpox, typhoid fever is not contracted by those who have anti-typhoid inoculations, and there is successful immunization against diphtheria.

It was only logical to hope to develop similar protection against infantile paralysis. And over a period of years scientists had been working toward that goal when the President's Birthday Ball Commission of the Georgia Warm Springs Foundation began to finance the research on this disease on a more adequate scale in 1935 than ever before.

There were many riddles and much divergence of opinion.

Would a vaccine made from the virus, unseen and unknown because its size is beyond the reach of the microscope, protect monkeys, only experimental animals that will contract the disease? Yes, said two groups of experimenters, and we are ready to immunize children.

Hold on, said other equally reputable scientists, infantile paralysis attacks relatively few children in a given community. It would be wasteful to vaccinate all of them. And for some reason entirely mysterious the bulk of the children, even young children, are naturally immune to this plague. Perhaps we can find some way to put our fingers upon endangered children and then immunize them if we find out how.

Actual Trial

There was an epidemic in 1935 and experimental protective vaccines were deemed ready for human trial by their protagonists. Two sorts were used rather extensively. One, the Park-Brodie vaccine, was given field trials in epidemic areas with the financial support of the President's Birthday Ball Research Commission.

ANCIENT

An important official family of sixteenth century Virginia—as the society page might say—is pictured here. They are the wife and charming daughter of Chief Pomeoc painted by John White for Sir Walter Raleigh. Note the Elizabethan doll with feathered hat carried by the little Indian girl.

MODERN

Miss Nellie Courtney, who is "one-half Kiowa Indian," examines one of the finer portraits in the Smithsonian's historic collection of painted Indians. The big chief with the pipe is Touch the Cloud, a Sioux, painted by Henry Ulke in 1877.

The vaccines did not do what was expected of them; they did not protect. Here was "negative knowledge." Scientists, good scientists, are quick to drop even pet projects when seemingly good ideas, careful work and high hopes are proved wrong. Enormous time, energy and money have been wasted in many fields of medical science by the perpetuation of use of various erroneous remedies and alleged preventives not subjected to critical scrutiny of other workers.

Inside a year research decks were cleared for new research. Grantees of the Commission, checking the original work, were unable to support the claim that formalinized vaccine protected monkeys or produced immunity in their blood. And the unvaccinated children of the 1935 North Carolina epidemic produced virus-neutralizing substances about as fast as the vaccinated.

Still Hope

Does that mean there is no hope of immunizing against infantile paralysis? Not necessarily. Dr. Sidney D. Kramer of Long Island Medical College, for instance, has a treatment that makes monkeys, normally 100 per cent. susceptible to the disease, immune. Half to three-quarters of those treated are protected. It is a very simple spraying of the nose with a mixture of a pituitrin extract, ephedrine and adrenaline. And he is working also with a vaccine, an ingenious mixture of virulent virus with a serum that holds the paralyzing, fatal activity of the virus in check. These may be the solution. Tests will tell.

Chemical warfare is the present hope of preventing infantile paralysis. Nose and throat specialists are spraying noses with a chemical, zinc sulphate solution, to blockade the path of the submicroscopic marauders through the nerves of smell to the spinal cord and brain where they produce paralysis and sometimes death.

Immunization attempts had failed, both the earlier treatment with so-called immune blood serum and the later vaccines made from the virus. Probably one of the troubles was that the infantile paralysis virus lives in and destroys nerve tissue. It cannot be reached through the blood. Two research groups, one consisting of Dr. Maurice Brodie of New York City and Dr. Arthur R. Elvidge of McGill University, the other of Drs. E. W. Schultz, Harold Faber and L. E. Gebhardt of Stanford University, had demonstrated that it is through the delicate, hairlike endings of the nerves of smell high in the roof of the nose that virus invades the victim.

On two sides of the continent, quite independently, two investigators — Dr. Charles Armstrong of the U. S. Public Health Service at Washington, D. C., and Dr. E. W. Schultz at Stanford University, Calif.—hit upon the same idea. Would a simple, safe chemical applied to these nerves of smell protect the monkey or child against the disease?

Chemical Experiment

It did, in monkeys. Both found that alum or tannic acid would do the trick. Then both—and working independently still—found picric acid was even better. Dr. Armstrong and Dr. W. T. Harrison used the picric acid spray in the human epidemic in Alabama, Mississippi and Tennessee in the summer of 1936. And last winter and autumn Dr. Schultz searching for a chemical, better, conferring longer protection, and if possible less irritating, discovered that weak solutions of zinc sulphate sprayed in monkeys' noses conferred almost 100 per cent. protection against overwhelming inoculations of otherwise fatal infantile paralysis virus. And the protection lasted one or two months, not just a few days.

The experience resulting from the use of Dr. Armstrong's picric acid-alum preventive used in the South's 1936 epidemic was encouraging. There was evidence that mass sprayings by mothers and fathers, certainly not skillful or positively protecting, nevertheless caused an

ETHNOLOGY

Material In Museum For Gallery of Indian Art

THERE'S the makings of a national gallery of old American portraits at the Smithsonian Institution in Washington.

In other words, Indian paintings—hundreds of historic portraits—are scattered around the walls of curators' offices or stored carefully away. A few weeks ago, Herbert Krieger, curator of ethnology, selected a couple of hundred choice specimens, and made up an exhibit, so the streams of tourists who drift through Washington can get an idea of what a real Indian art gallery would be like.

First European artist who went in for Indian portraits was John White, who was told by Sir Walter Raleigh to make records of the strange natives in the Virginia colony region. White's pictures are treasured by the British Museum. The Smithsonian once had a painter copy them, and is almost as proud of the fine copies as if they were originals.

White was a better observer than artist. He once painted an Indian with two right feet.

Whatever you think of White's art, you can learn a lot about old-fashioned Virginia and Carolina Indians from his portraits. On many occasions, these Indians wore more paint than clothes, and White shows how varied were the body decorations. Looking at his pictures shows you why museum curators find it hard to be helpful when some historic-minded person writes in anxiously to say he is going to be an Indian in a southern historic pageant, and what should he wear.

Most prolific of historic Indian painters was George Catlin, whose brush recorded 3,000 figures, in portraits or scenes. The Smithsonian has 550 original Catlins.

An extraordinary person, George Catlin early in the eighteenth century grew so interested in Indians that he left his law office, his books, and his wife and set out to paint nothing but Indians. Journeying by canoe and packhorse, he got around the Plains country and the Great Lakes region and other Indian haunts, and managed to paint 48 different tribes.

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apparent decrease in the cases occurring.

With a more effective chemical and with more knowledge of how the spray should be applied, there is hope that the preventive treatments are saving many more children this year. One thing is certain from research by Dr. Max M. Peet and his associate at the University of Michigan. The spray must be applied by experts so that it reaches high in the nose so as to block the nerves of smell. It is no job for an amateur or an ordinary nasal atomizer.

So temporary, epidemic protection against the dread polio may have been achieved. The tests are not yet complete, but the prospects are good for success. A year or two should tell.

Meanwhile the fight goes on, unabated. There are so many questions still unanswered.

If physicians could sort out by some sort of simple test those children who are susceptible to infantile paralysis from those who are not, the fight against this disease would be made more effective.

The Schick test is used upon thousands of children annually to tell whether they need to be protected against diphtheria or whether nature has already done it. A similar test in the case of infantile paralysis is the goal of one of the many researches supported by the President's Birthday Ball Commission for Infantile Paralysis Research.

As a first step toward this objective Dr. Joseph Stokes, Jr., of the University of Pennsylvania is hard at work at the chemical "purification" of the virus, that is, he is freeing it from nerve tissue of monkeys which at present is the only source from which experimenters can obtain it. The presence of the monkey nerve tissue would obscure any skin test that might be attempted on children. Pure virus promises to be the first step toward a susceptibility test.

Immunity a Puzzle

Another problem is just why children are susceptible. Dr. W. L. Aycock of Harvard, a grantee from the same fund, has boldly questioned whether the so-called immunity of the blood, long a test used medically, really has anything to do with human resistance to this plague. Evidence has accumulated in the past two or three years that the disease's virus lives and propagates in the nerve tissues, not affecting the blood.

Glands may be a vital factor in protection. Dr. Aycock found that castrated monkeys, with their sex, pituitary and other glands upset, have thinner mucous membranes of their noses, making them easier to infect. Gland preparations may aid protection in both monkeys and men.

A little cloud on the research horizon arises because there seem to be several kinds of infantile paralysis virus. The epidemics of 1934-5-6 in California were of a milder disease than those in the East and Europe. But scientists suspect that it is also more contagious, more easily passed from victim to victim. This is suggested in experiments by Drs. John Paul and James D. Trask of Yale University Medical School.

This is alarming, but what is even more worrisome is that this virus can be passed from one monkey to another by simply injecting it into the skin. Should this hold, too, for human beings, with new viruses in future epidemics, what then would become of the hopeful protection by spraying chemical solutions into noses?

It would help greatly if the virus could be grown outside the animal body the way visible germs are cultivated. Now the only source of the virus is the nerve tissue of dying monkeys. Already Dr. Peter Olitsky at the Rockefeller Institute has propagated the dangerous agent in the nerve tissue of human embryos. With financial support of the Commission, two other research groups, those of Dr. Karl F. Meyer of University of California Medical School and Dr. Paul Clark of University of Wisconsin Medical School, are also tackling this problem.

May Not Be Alive

The virus may prove to be a chemical and not a living germ, or some strange bridge between the two, such as other viruses seem to be.

Such fighting against this disease must be continued for the sake of humanity. The President's Birthday Ball of 1935 has kept research underway in many centers. And the fight is only beginning.

The scientific battle against infantile paralysis must continue. Funds must be provided to allow the scientists to work at full capacity. Perhaps President Roosevelt will have to have another birthday.

To medicine's progress, the present campaign points a method that can be applied to research upon other diseases, such as cancer, syphilis, or the blood pressure disease. Planning boards could be set up to serve, inform and coor-

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dinate medical research workers in these fields just as the Infantile Paralysis Research Commission has drawn together, without invasion of individual initiative and enterprise, nearly all infantile paralysis research, whether financially supported by them or not.

Continuation and extension of the research upon infantile paralysis is indicated by President Roosevelt's recent announcement of a new National Foundation for Infantile Paralysis to be formed shortly.

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ARCHAEOLOGY

Seek Virginia Indians Older Than Known Tribes

THE ancient history of Virginia is proving hard to write.

Most of it is so far lost that archaeologists are assembling it from small puzzle pieces, indeed—such things as fragments of pottery and stone tools. These scraps, however, interpreted by experts, are bringing to light the real "first families of Virginia," and may eventually show where they hailed from.

A good deal of attention is being given to the archaeology of this historic state by David I. Bushnell, Jr., of the Smithsonian Institution. Mr. Bushnell roams hills and fields of the state to examine sites where Indians once had flourishing villages.

He has just published a report on sites below the falls of the Rappahannock, where lived Algonquian Indians who knew Capt. John Smith and his Jamestown colonists. Some of the Indian villages on Smith's famous 1624 map of Virginia can be identified with more or less certainty.

These interesting Algonquians, Mr. Bushnell points out, were far from being the earliest Virginians. On the ground at their deserted camp are relics of several periods of occupancy. Most of this material seems to be from Indian trash heaps, which white settlers scattered when they pushed their plows over the ground.

Carefully salvaging the fragments of Indian existence, Mr. Bushnell finds imprints of cloth and netting on clay bowls —showing types of textiles these tribes made. He studies types of stone knives skilfully flaked, and styles of pottery used in early Virginia housekeeping. Some objects he assigns to earlier eras than others.

Underground may still be hidden the foundations of houses and also burials, perhaps in levels indicating their ages.

There may be some thousands of years of human existence to account for, before the story is done, for the Rappahannock's left bank has yielded one Folsom-type dart point, and in western states the hunters who made this kind of stone weapon are rated as having roamed some 10,000 years ago.

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GEOGRAPHY

Vikings Rivaled Chinese As Compass Inventors

VIKING navigators, who explored and settled in North America four centuries before Columbus, and left their sagas to intrigue and stimulate him in his dreams, may also have been the inventors of the mariner's compass that guided him across the ocean. This is the opinion of a Berlin geographer, Heinrich Winter, who has been making a search for medieval manuscripts for mentions of the use of the magnetic compass.

Herr Winter discounts the commonly accepted story that the compass was first invented by the Chinese, then passed by them to the Arabs, and learned from the Arabs by navigators of Amalfi, in southern Italy. Arabian mention of the compass, he states, is later than a number of references in the medieval literature of western Europe.

There is at least one definite mention of the compass as early as the middle of the thirteenth century, and numbers of references in the fourteenth. Even the phenomenon of compass variation with change in longitude, which terrified Columbus' sailors, was known in the fourteenth century, declares Herr Winter, adding that it was mentioned by the English poet Chaucer in 1380.

The earliest type of compass was simply a piece of natural magnetic iron ore enclosed in a small box and floated in a basin of water. This magnetite compass was called a "leidarsteinn" by the Norsemen. This word is cognate with early English "lodestone," and means the same thing—a stone that leads or guides. Another Norse name for it was "sejersten," which means "sailing-stone."

Herr Winter believes that Norse sailors brought their invention south with them. There was a Norman Kingdom of Sicily in the Middle Ages, which could serve as a contact-point for exchange of information between the men of the North and the seafarers of Italy.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF MARCH 3, 1933

Of SCIENCE NEWS LETTER published weekly at Washington, D. C., for Oct. 1, 1937.

Washington
District of Columbia
ss.

Before me, a Notary Public in and for the District of Columbia aforesaid, personally appeared Watson Davis, who, having been duly sworn according to law, deposes and says that he is the Editor of the SCIENCE NEWS LETTER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

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Watson Davis,
Editor

Sworn to and subscribed before me this 28th day of September, 1937.

[SEAL]

Charles L. Wade

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RADIO

October 12, 5:30 p. m., E.S.T.

INDIANS WHO MET COLUMBUS—Herbert W. Krieger of the Smithsonian Institution.

October 19, 5:30 p. m., E.S.T.

COUNTING BIRD NOSES—William Vogt, Editor of "Bird Lore".

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

From Page 227

for a wax making concern at Racine, Wisconsin, Mr. Wright started from the bottom and fashioned an absolutely new unit.

The basis of Mr. Wright's new building is his upside-down "flower" column, as he terms it. The column is nine inches in diameter at its base, and widens gradually through its "stem." At the top of the "stem," there is a hollow cup, termed botanically the "calyx," which supports a large concrete dish, 18½ feet in diameter, called the "petal." The column is 21 feet 7½ inches high, which, with its base of nine inches, and according to present theories, should only be 6 feet 9 inches.

Far from being weak, however, the column supported a test load of 60 tons, and then it toppled only from an unbalanced load. Mr. Wright credits the great strength of the column to a steel mesh core, which he adapted to reinforce it, where in other structures steel rods are used. He explained that rods represent "bones of a human foot," where mesh represented "muscles and sinews," which are much stronger than bones.

In explaining the functional value of the column, Mr. Wright pointed out that: "By tapering the columns to nine inches at the floor we increase the building's floor space, we use a fraction of the concrete and steel that would ordinarily be used, we cut the cost and at the same time cut the dead weight." An estimated one third of the space will be conserved with the use of the column.

On the main floor of the building, there are 54 columns spaced 20 feet apart on center. The greatest weight that any of them will carry will be 12 tons, and the average weight will be two tons. This floor is one big room. On the theory that the quickest way to lose space is to have partitions, Mr. Wright has installed all the office workers at individual desks in the center of the room, and the department officials around the sides in glassed-in cubby holes. All activity may be seen by one person.

The diamond shaped roof areas between the "petals" of the columns are filled in with glass. These skylights will admit light and reduce the expense of artificial lighting throughout the main part of the building which is but one story high. Decorative strips running full length along the sides of the building and around the edge of the roof are also of glass, and serve to admit light.

Mr. Wright's building technique is based entirely on what he terms "organic" architecture. It is the "marriage" of building materials. The concrete flows into the crevices of the bricks of the walls and fuses them into a solid wall. His plea is for more creative workmanship and less "machine age" standardized architecture.

The building is designed on the principle of air conditioning, and for this reason, there are no windows to be opened. It will be heated by steam pipes installed in the floor.

Science News Letter, October 9, 1937

First Glances at New Books

Medicine

ADAPTATION IN PATHOLOGICAL PROCESSES—William H. Welch—*Johns Hopkins,* 58 p., $1.50. One of the series of Bibliotheca Medica Americana of the Institute of the History of Medicine of the Johns Hopkins University. Older physicians will be glad to reread this presidential oration by one of America's great medical leaders and present-day medical students will find this 40-year-old essay as stimulating and enlightening as any medical lecture they listen to today.

Science News Letter, October 9, 1937

Archaeology

INDIAN SITES BELOW THE FALLS OF THE RAPPAHANNOCK, VIRGINIA—David I. Bushnell, Jr.—*Smithsonian,* 65 p., illus., 75 c. See page 237.

Science News Letter, October 9, 1937

Ornithology

THE NATURAL HISTORY OF MAGPIES—Jean M. Linsdale—*Cooper Ornithological Club,* 234 p., illus., $3.50 paper, $4.25 cloth (plus 3% sales tax if delivered in Calif.). An exhaustive, thoroughly documented, well illustrated monograph on the distribution, habits, etc. of one of the most interesting of bird genera.

Science News Letter, October 9, 1937

Dendrology

TEXTBOOK OF DENDROLOGY—William M. Harlow and Ellwood S. Harrar—*McGraw-Hill,* 527 p., illus., $4.50. Useful alike to forester and general field botanist is this new textbook. In concise, businesslike yet scholarly fashion it describes the principal forest trees of northern America and tells what they are good for. The photographic figures illustrating critical identification characters are of exceptional merit.

Science News Letter, October 9, 1937

Science

THE ADVANCEMENT OF SCIENCE: 1937—*British Association for the Advancement of Science, London,* 264 p., 3 shillings and sixpence. The annual volume containing the important leading addresses before the B. A. A. S. meeting at Nottingham.

Science News Letter, October 9, 1937

Geography

THE FRAME OF THE ANCIENT GREEK MAPS—William Arthur Heidel—*American Geographical Soc.,* 141 p., $2.50. See page 232.

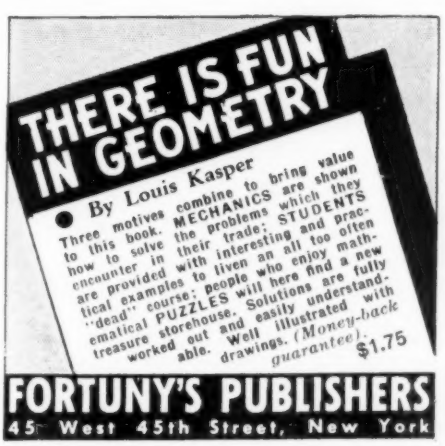
Science News Letter, October 9, 1937

Zoology

THE BIRDS AND MAMMALS OF THE WESTERN SLOPE OF THE AZUERO PENINSULA (REPUBLIC OF PANAMA)—John Warren Aldrich and Benjamin Patterson Bole, Jr.—*Cleveland Museum of Natural History,* 196 p., $1.75. A monograph covering very thoroughly a limited area inhabited by a characteristic neotropical fauna.

Science News Letter, October 9, 1937

A dog can hear higher-pitched sounds than you can.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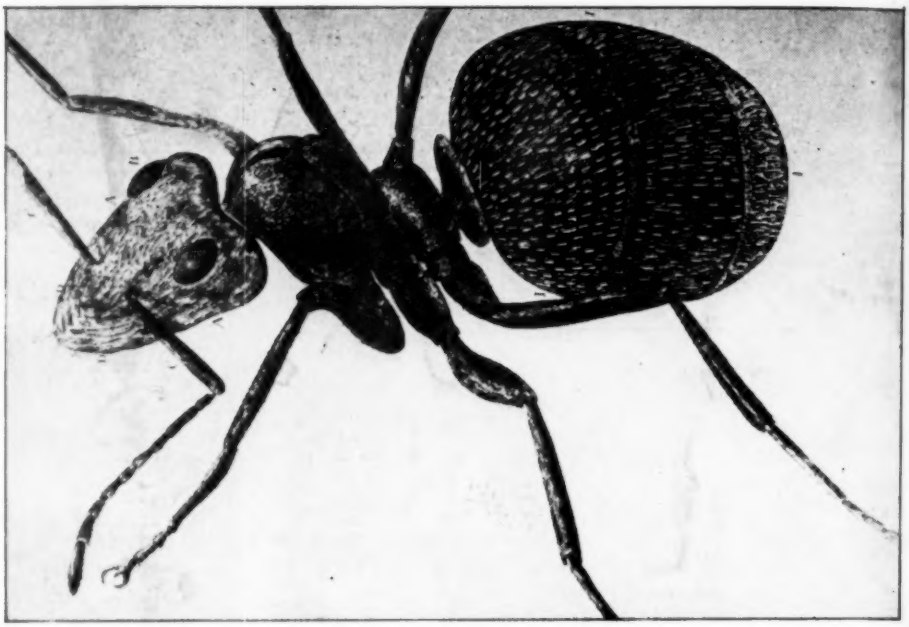

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